

## How Micro-Level Determinants Affect the Capital Structure Choice: Evidence from Bosnia and Herzegovina

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**Abstract:** *The purpose of this study is to examine two leverage ratios using a sample of non-financial companies in Bosnia and Herzegovina (BiH). It was done by taking into account the joint effect of traditional capital structure determinants and managers' personal values and aspirations. We applied hierarchical regression analysis to determine the contribution of profitability indicators, firm size indicators, assets, growth, networking, managerial strategies, managerial psychology, managerial human capital and earnings volatility to explain the variance in capital structure. The results suggest that companies with less experienced owners/managers and higher firm growth have higher financial leverage ratios. In the analysis of the balance sheet leverage, financial proxies of capital structure seem to be significant in explaining capital structure variance. Therefore, companies with lower profitability, a lower level of fixed assets and higher growth opportunities have higher balance sheet leverage ratios. The findings provide better understanding of theoretical perspectives that can best explain how companies choose their capital structure in the transition economy context. Furthermore, empirical findings should help corporate managers to make optimal capital structure decisions.*

**Key words:** *Capital Structure Choice, Firm Characteristics, Managerial Traits, Hierarchical Regression Analysis, Transition Economy*

**JEL Classification:** *D03, G02*

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## Introduction

Although there is a universal consensus that financial theories have contributed to the understanding of capital structure decision-making, these financial theories disregard the role played by firm management in determining capital structure, especially for small and medium-sized enterprises (SMEs), where managers exert a greater influence on the financing decisions compared to larger firms (Norton, 1991; Matthews et al., 1994), as is the case in Bosnia and Herzegovina (BiH). Considering the significance of management influence in making financing decisions, management researchers have developed a variety of alternative theoretical frameworks based on diverse paradigms (as strategic management, psychology and sociology) to describe how financing decisions in SMEs are made (Barton and Matthews, 1989; Matthews et al., 1994; Romano et al., 2000; Ang et al., 2010; Hackbarth, 2008).

This group of different management-based theories required an overall theoretical framework until Van Auken's (2005) launch of a model illustrating the dynamics of SMEs capital acquisition decisions, which recognized the primary determinants influencing the decisions on capital acquisition as being built on managerial characteristics and attitudes. This model incorporates a number of managerial factors which may affect the capital structure choice such as experience, risk preference, growth intentions and networking. Using the theoretical structure of Van Auken's (2005), we identify managers' influences on capital structure as consisting of managerial features (managerial network ties, education and experience) and attitudes (managerial aversion to external control, risk-taking propensity and growth intentions). Within this framework, we also consider firm-level characteristics such as size, profitability, asset structure, growth opportunity and earnings volatility, proposed by the conventional capital structure theories, to determine the extent to which managerial factors in conjunction with firm-level characteristics influence the capital structure choice of SMEs.

The objective of this paper is to examine the importance of manager traits and attitudes in explaining the decisions made regarding capital structure in companies in developing economies/economies in transition, while using a sample of FBiH<sup>1</sup> enterprises. Our findings should provide deeper understanding of theoretical perspectives which best explain how companies choose their capital structure in the developing context. In particular, we contend that extending traditional capital structure theory to account for these managerial traits can decrease some important gaps between the known theoretical predictions and the unresolved empirical facts. In particular, financial executives in developing countries may hold different attitudes than their counterparts in developed countries. On the other hand, although there is some evidence (Booth et al., 2001) that developing countries have similar capital structures to those in developed countries, the firm variables have a relatively low effect on the structures. The reason for the poor cause and effect relationship may be due to institutional factors and management preferences. Therefore, this study brings together research on financial and strategic management, decision making, as well as social psychology in order to develop a conceptual model for understanding capital structure decision-making in privately held firms.

## Literature Review

Growth intentions and profit maximization are two managerial objectives that have gained the most attention in the literature with regards to their relationship to capital structure. Berggren et al. (2000) assert that decision-makers whose leading aim is business growth will tend to be less control averse and more active in searching for external sources of finance when internally originated funds are insufficient. Although limited empirical work has been conducted on how the manager's intentions to maximize profit influence financing decisions, it is suspected that firms with intentions to maximize profits in the short-term will seek higher levels of short-term financing to take advantage of economic opportunities that present themselves. Such firms, however, should therefore be less reliant on long-term financing in their capital structure. Barton & Matthews (1989) and Matthews et al. (1994) were the first to emphasize that the risk propensity and control aversion of decision-makers may be significant determinants of capital structure in SMEs. The preceding empirical work performed on SMEs in Western economies validates that some managers prefer internal sources of funds, fearing that dependence on external sources of finance might lead to a loss of control over the firm and restrict the authority of owners to make decisions autonomously (Berger and Udell, 1998; Harvey & Evans, 1995; Hutchinson, 1995). In China and in many other emerging and developing economies, a weak institutional environment reinforces agency problems and leads to greater mistrust between managers and external capital providers (Young et al., 2008). Barton and Matthews (1989) and Matthews et al. (1994) suggest that the risk-taking propensity of SME manager will influence the debt level they are willing to adopt. In general, managers with risk perception bias believe their company is less risky than it actually is and therefore less likely to experience financial distress. Because of a weak institutional environment, risk-taking propensity might be expected to have an even bigger influence on the financing choices of SMEs in emerging and developing economies.

Human capital may affect the capital structure of SMEs in a number of ways. The value of a manager's human capital, defined here as the knowledge and diverse skills of the SMEs managers (Hatch and Dyer, 2004), depends on the firm's business strategy. Some studies suggest that human capital is positively linked to the use of debt in SMEs (Bates, 1990; Zhang, 2008) while others find no or a negative relationship (Scherr et al., 1993; Romano et al., 2000; Cassar, 2004). For example, Scherr et al., (1993) observe a negative and statistically significant relationship between the age, managerial experience and education level of the manager and the use of debt in the capital structures of SMEs. However, research conducted by Zhang in 2008 on the sample of SMEs in China showed that companies whose managers are more highly educated are more likely to rely on formal debt financing. This positive relationship could be attributed to the fact that managers holding college degrees and/or graduate degrees are assumed to have the additional knowledge required for better decision-making and consequently may be more competent than managers without those degrees. Additionally, their educational background might be an indication to outside investors about the firm's human capital quality and influence the creditor's willingness

to approve the loan. As far as managers' experience is concerned, experienced managers should have the capability to better perform risk assessment (Ozgen and Baron, 2007). The owner's/manager's background and experience are assets that contribute to the decision-making regarding access to resources – including financial resources – and consequently signal the competitive advantage of that company (Schutjens and Wever, 2005). It is important to note that the human capital immanent in the manager's prior experience plays a more important role in decreasing the asymmetric information between the firm and external investors in developing economies than is the case in developed economies. Generally, research studies performed in developed economies show a negative relationship or no relationship between the age of the manager and the company's reliance on external financial sources (Scherr et al., 1994; Romano et al., 2000). Scherr et al. (1994) offer the possible reasons for such findings: the unwillingness of financiers to lend to older people because of shorter anticipated time of their ownership, the fact that older owners/managers are more risk averse in comparison to those younger, but also having in mind that older owners/managers are wealthier than the younger ones, which allows them to use more of their personal wealth to finance their business operations. Applications for bank loans are also influenced by the social capital, i.e. the actual and potential resources reachable through an actor's network of relationships (Nahapiet and Ghosal, 1998). Because of the lack of publicly-available data on SMEs, financiers often depend on their informal contacts with managers at other firms to assess the creditworthiness of a loan applicant and the feasibility of their business proposals (Nguyen et al., 2006). In this study, we use Wu's and Leung's (2005), definition of network ties. Despite a growing amount of work on the role played by network ties in the financing behavior of firms, limited work has examined how network ties might influence the capital structure of companies.

### *Empirical Framework*

This study is an attempt to give a comprehensive and robust analysis of the determinants of the capital structure of FBiH firms. The conceptualization of corporate structure choice employed in this research adds firm-level characteristics proposed by traditional financing theories to the managerial factors influencing the capital structure choice, to propose and test a new theoretical model (Figure 1). Using Van Auken's (2005) structure, we identify manager influences on capital structure as consisting of managerial characteristics (managerial network ties, education and experience) and attitudes (managerial aversion to external control, risk-taking propensity and growth intentions). We seek to determine the extent to which each of the proposed factors influences the capital structure of FBiH companies, when pooled together. The research results will provide the following information: (1) To what extent the existing capital structure theories from the finance paradigm can adequately explain the financial behavior of firms in the developing economy context? (2) To what extent the managerial strategy, psychology, human capital and network ties influence the capital structure of firms in FBiH?

Figure 1. Conceptual Framework of Capital Structure Choice

Capital structure	Manager's level determinants	Manager's characteristics	Managerial strategy
			Managerial psychology
		Manager's attitudes	Managerial human capital
			Network ties
	Firm's level determinants	Firm size	
		Profitability	
		Growth opportunity	
		Asset tangibility	
		Risk	

Source: Framework proposed by authors

The main research hypothesis of the study is as follows:

- Personal characteristics and attitudes (latent factors: managerial strategy, managerial psychology, managerial human capital and network ties) coupled with traditional capital structure determinants (latent factors: assets, firm's size, asset tangibility, and growth opportunities with earnings volatility as the observed variable) are determinants of the capital structure.

Based on the literature review provided above, assumptions about the influence of managerial characteristics on capital can be articulated through the following hypotheses: 1) the growth intentions of the manager are positively correlated to leverage, 2) the intention of the manager to maximize profit is positively correlated to leverage, 3) the aversion to external control of the manager is negatively correlated to leverage, 4) the manager's risk-taking propensity is positively correlated to leverage, 5) the educational level of the manager is positively correlated to leverage, 6) the managerial experience of the manager is positively correlated to leverage, 7) the age of the manager is negatively correlated to leverage and 8) manager's personal network ties with other companies, government officers and banks will be positively correlated to the leverage.

#### *Data Collection and Sampling*

The variables we use for the analysis are taken partly from financial statements and partly from a survey. While surveys have limitations (e.g., non-respondent bias), at least they give a window into executive thinking on capital structure. They try to find the hidden motivation behind the financing choice and have the advantage that they can question difficult to measure and complex factors.

Due to the financial statements data availability, this study will focus on one entity, the Federation of BiH (FBiH). We used the AFIP (Agency for the Financial, IT and Intermediary Services) dataset for the 2012 that maintains a comprehensive financial database of all companies operating in the FBiH, containing 19,446 firm-year observations. The AFIP database is made available for commercial use by “*Tron Systems*”. This database contains the balance sheets and income statements of all companies obliged to submit their reports to the AFIP, under the law. After collecting the data, but before running the main data analyses, we performed a dataset screening process for ungrouped data (Tabachnik and Fidell, 2013). After initial screening, our dataset contained a total of 18,393 firm-year observations, where the limited liability company is the dominant legal form of organization accounting for over 97.5% of the sample analyzed in the observed year. Having in mind that fact, owners will be very often also the managers of their companies.

The focus of our empirical enquiry/study is capital structure decision of joint stock (JSC) as limited liability companies (Ltd), stratified by 16 different industries. In order to better understand the characteristics of the homogenous subsets (Albright, Winston, and Zappe, 2006), we had to exclude a certain number of enterprises from the population data. In particular, we eliminated the companies legally organized as neither JSC nor Ltd. Furthermore, banks, financial companies, and insurance companies were also removed from the sample because of their specific financial structure. Investment companies were neither included, because their income mainly results from the value of their holding portfolios. This value depends on the financial structure and business conditions of the firms whose stocks are included in the portfolio rather than the financial structure of the investment companies. This restriction is necessary because banks, as well as insurance and investment companies are subject to rigorous regulations concerning their capital structure and financing decisions and are additionally severely affected by exogenous factors (Rajan and Zingales, 1995).

Additionally, out of the entire sample of companies present in 2012, a random selection of 450 companies among different industries was made in order to apply an online questionnaire ensuring additional data on managerial psychology, managerial strategies, managerial, human capital and network ties. The questionnaire was distributed to the sample of enterprises from the dataset used in the first research stage, selected from the sampling frame using: (i) random number tables and (ii) random number generator, such as Research Randomizer (2008). This sampling technique was possible as the sampling frame was vast enough. We applied a questionnaire used in past research on firm financing decisions, including Van Auken (2005) and Carter and Van Auken (2005). The respondents were asked to identify characteristics of their firms, ownership structure, number of employees and the size of market served. The second section asked respondents to rank perceptions (1=strongly disagree to 5=strongly agree) of 25 issues related to network resources, business objectives and external financing. In the third section, we asked them questions about the personal characteristics of the managing director. Pretesting was conducted in order to test for clarity, after which the questionnaire was slightly revised. The main changes were made to the formulation of questions.



We received 242 questionnaires that satisfied the recommended sample size gained via sample power analysis performed using G\*Power 3.1.7. of 205. But the response ratio of 53.78% cannot be ignored, and we needed to check whether there was a presence of *non-response bias*. We applied the Mann – Whitney U test to see whether there was a statistically significant difference between the values of variables from the financial statements of companies that participated in the survey and companies that did not. Out of the 15 variables from financial statements used in further analysis only two variables<sup>ii</sup> showed a significant difference between the companies who responded and the companies that did not respond to the survey. Furthermore, we followed up by conducting another mini survey with the sample selected randomly from the non-respondents (those who did not participate in the actual survey). However, the follow-up survey was done using a different method of soliciting and data collection, to ensure that differences observed were not due to the survey method's effects. We conducted telephone interviews with 15 non-respondents asking them to complete the survey over the phone. When this was done, the researchers compared the responses between the respondents and the non-respondents on the key variables from the survey. We found no differences and therefore, we believe that the responses to our survey are non-response biased.

## Results and Discussion

Since the main research objective in this paper is to assess contribution of underlying manager's personal characteristics and attitudes with traditional capital structure determinants in explaining the firm's capital structure choices, we have employed standard and hierarchical regression analysis.

Leverage was measured by two variables (Welch, 2011): the financial-debt-to-capital ratio (*financial leverage*) that does not consider non-financial liabilities as debt [PCS1], and the total-liabilities-to assets ratio (*balance sheet leverage*) that treats financial and non-financial liabilities alike [PCS2]. Empirical capital structure research also faces another key question, which is whether to use book leverage or market leverage (book registered debt is divided by the sum of the registered debt plus the equity market value). We do not have that choice simply because we do not have the data on market values. The normality of distribution of almost all variables is violated before the data are transformed using natural logarithm. Only variables related to company size, balance-sheet leverage (total liabilities to assets ratio) and the age of the general manager meet the assumption of normality. Regression models are developed for each leverage dependent variable respectively.

The paper proposes capital structure determinants listed in Table 1. In order to run regression analysis with determinants that are having significant correlation with capital structure indicators, correlation between capital structure and determinants are presented.

Table 1. Correlation between Determinants and Capital Structure

Determinant	Code	$r$ Financial Leverage	$r$ Bal- ance-Sheet Leverage
Natural logarithm of total assets	[FSA]	.054	-.112
Natural logarithm of total revenues	[FSR]	.021	-.123
Natural logarithm of employees number	[FSE]	.069	-.122
The ratio of earnings before interest, taxes and depreciation to total assets	[PP1]	.072	-.084
The ratio of net income to the total assets	[PP2]	-.029	-.136*
The ratio of tangible fixed assets to the total assets	[PA1]	.023	-.167*
The ratio of intangible assets to total assets	[PA2]	.051	-.021
The ratio of inventories to total assets	[PA3]	.161*	.144*
The ratio of receivables to total assets	[PA4]	-.054	-.006
The ratio of difference in the book value of total asset between year $t_{-1}$ and year $t$ divided by the book value of the total assets in year $t_{-1}$	[PG1]	.010	-.065
The ratio of difference in total revenues between year $t_{-1}$ and year $t$ divided by total revenues in year $t_{-1}$	[PG2]	.083	.070
Regression of book value over the total assets over ten years on a time trend ; coefficient of the trend, scaled by the book value of the total assets, as proxy for growth	[PG3]	.164*	.198**
Growth intentions	[PMS1]	.094	-.004
Profit maximization intentions	[PMS2]	.069	.045
Control aversion	[PMP1]	-.071	-.067
Risk propensity	[PMP2]	.026	.035



Age of the manager	[MHC1]	-.057	-.127
Experience of the manager	[MHC2]	-.142*	-.135*
Educational level of the manager	[MHC3]	-.070	-.141*
Networking with other firms	[PN1]	.067	.044
Networking with Government officials	[PN2]	.073	.047
Networking with Banks	[PN3]	-.066	-.104
Earning Volatility	[PE]	-.072	-.076

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Analysis of correlations between proposed determinants and capital structure indicators shows that statistically significant correlations with financial leverage have the ratios of inventories to total assets [PA3], regression of book value [PG3] and experience of the manager [MHC2]. Companies with higher financial leverage have less experienced manager and with higher ratio of inventories to total assets and higher regression of book value as proxy of growth.

Balance-sheet leverage has statistically significant correlations with the ratio of net income to the total assets [PP2], the ratio of tangible fixed assets to the total assets [PA1], the ratio of inventories to total assets [PA3], the regression of book value [PG3], the experience of the manager [MHC2] and educational level of the manager [MHC3]. Companies with higher balance-sheet leverage have less ratio of net income and fixed assets to the total assets, higher ratio of inventories to total assets, higher regression of book value, less experienced manager and lower educational level of the owner and manager.

All statistically significant correlations between proposed determinants and capital structure indicators are low (below .20). Total contribution of determinants explaining capital structure will be calculated using linear regression model including only determinants with statistically significant correlations. The model for financial leverage will differ from model for balance sheet leverage considering that balance sheet leverage has more determinants with statistically significant correlations.

#### *Regression model with determinants of financial leverage*

Independent variables in the model are:

- [PA3] The ratio of inventories to total assets
- [PG3] Regression of book value of the total assets over ten years on a time trend; coefficient of the trend, scaled by the book value of the total assets
- [MHC2] Experience of the manager

The ratio of inventories to total assets, regression of book value and experience of the manager explains about 6% of variance of financial leverage. Explained variance is statistically significant ( $F=6.093$ ;  $P=0.001$ ) and differs from expected random guess. Even though the model has statistically significant prediction, predictive power is rather low.

Table 2. Model Summary for Financial Leverage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.274 <sup>a</sup>	.075	.063	.2759008

The collinearity statistics parameters indicate that there are no issues with multicollinearity among independent variables (all VIF lower than 2). The ratio of inventories to total assets and regression book of value have significant contribution to explanation of financial leverage variance while experience of the manager does not have significant contribution (chances for random contribution are over 5% but less than 6%).

Table 3. Coefficients for Financial Leverage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.388	.064		6.110	.000		
	PA3	.174	.064	.175	2.716	.007	.986	1.014
	PG3	.176	.064	.176	2.736	.007	.984	1.016
	MHC2	-.132	.068	-.125	-1.948	.053	.995	1.005

Before concluding on significant determinants of financial leverage we run hierarchical regression analysis with first block of independent variables being set to the ratio of inventories to the total assets and regression book of values while in second block all other determinants (from Table 1). In such case (amended regression model) experience of the manager and both profitability indicators (the ratio of earnings before interest, taxes and depreciation to total assets and the ratio of net income to the total assets) have additional contribution to financial leverage variance. Hierarchical regression model is rerun with experience and profitability determinants being in the second block of independent variables.

Adding second block of determinants improve predictions by 3.1% (adjusted R square) that is statistically significant.

Table 4. Amended Model Summary for Financial Leverage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.244 <sup>a</sup>	.059	.051	.2775929	.059	7.155	2	227	.001
2	.337 <sup>b</sup>	.113	.094	.2713040	.054	4.549	3	224	.004

The ratio of inventories to the total assets, regression book of values, experience of the manager, the ratio of earnings before interest, taxes and depreciation to total assets and the ratio of net income to the total assets are all significantly contributing to explanation of financial leverage variance. Higher financial leverage have companies with higher ratio of inventories to the total assets, higher regression book of values, higher ratio of earnings before interest, taxes and depreciation to total assets, lower experience of the manager and lower ratio of net income to the total assets.

Table 5. Amended Model for Financial Leverage Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Std. Error	Beta				VIF	
1	(Constant)	.315	.052		6.108	.000		
	PA3	.180	.064	.181	2.792	.006	.988	1.012
	PG3	.184	.065	.184	2.841	.005	.988	1.012
2	(Constant)	.406	.066		6.164	.000		
	PA3	.175	.063	.176	2.785	.006	.986	1.014
	PG3	.189	.068	.189	2.783	.006	.855	1.169
	MHC2	-.147	.067	-.139	-2.186	.030	.985	1.015
	PP1	.325	.117	.327	2.787	.006	.287	3.480
	PP2	-.360	.117	-.362	-3.086	.002	.288	3.472

Third set of independent variables are entered in the regression analysis to check for possible additional contribution of remaining variables from original model, however none of them had additional statistically significant contribution to explanation of financial leverage variance.

Among independent variables that are having significant contribution explaining financial leverage significant positive correlations are between profitability indicators (the ratio of earnings before interest, taxes and depreciation to total assets and the ratio of net income to the total assets), and between regression book of values and both profitability indicators. Correlation between profitability indicators is quite high (over 0.80) while correlations between regression book of values and profitability indicators are smaller (app. 0.35).

Table 6. Pearson Correlation between Independent Variables with Significant Predictive Validity of Financial Leverage

	PA3	PG3	MHC2	PP1	PP2
PA3	1	-.109	-.040	-.045	-.039
PG3	-.109	1	-.056	.345**	.349**
MHC2	-.040	-.056	1	.058	.012
PP1	-.045	.345**	.058	1	.841**
PP2	-.039	.349**	.012	.841**	1

\*\*. Correlation is significant at the 0.01 level (2-tailed).

#### *Regression model with determinants of balance-sheet leverage*

Independent variables in the model are:

- [PP2] The ratio of net income to the total assets
- [PA1] The ratio of tangible fixed assets to the total assets
- [PA3] The ratio of inventories to total assets
- [PG3] Regression of book value of the total assets over ten years on a time trend; coefficient of the trend, scaled by the book value of the total assets
- [MHC2] Experience of the manager
- [MHC3] Educational level of the manager

Independent variables explain about 13.5% of variance of balance-sheet leverage. Explained variance is statistically significant ( $F=6.970$ ;  $P=0.000$ ) and differs from expected random guess. Predictive power for balance sheet leverage is about 7.5% higher than for the finance leverage.

Table 7. Model Summary for Balance-sheet Leverage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.397 <sup>a</sup>	.158	.135	.27656

The collinearity statistics parameters indicate that there are no issues with multicollinearity among independent variables (all VIF lower than 2). The ratio of net income to the total assets, the ratio of tangible fixed assets to the total assets, the ratio

of inventories to total assets and regression book of value have significant contribution to explanation of balance-sheet leverage variance while experience of the manager and the education level of the manager do not have significant contribution.

Table 8. Coefficients for Balance-sheet Leverage

Model	B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Std. Error	Beta				Tolerance	VIF
1	(Constant)	.673	.084		7.975	.000		
	PP2	-.238	.069	-.229	-3.460	.001	.860	1.163
	PA1	-.145	.065	-.139	-2.214	.028	.952	1.050
	PA3	.148	.065	.143	2.271	.024	.953	1.049
	PG3	.282	.069	.270	4.066	.000	.855	1.169
	MHC2	-.114	.068	-.103	-1.673	.096	.991	1.009
	MHC3	-.113	.065	-.108	-1.746	.082	.981	1.020

Before concluding on significant determinants of balance-sheet leverage we run hierarchical regression analysis with first block of independent variables being set to the ratio of net income to the total assets, the ratio of tangible fixed assets to the total assets, the ratio of inventories to total assets and regression book of value while in second block all other determinants (from Table 1). In such case, (amended regression model) none of the independent variables have additional statistically significant contribution to explanation of balance-sheet variance. Adding second block of determinants does not improve predictions.

Higher balance-sheet leverage have companies with lower ratio of net income to the total assets, and lower ratio of tangible fixed assets to the total assets while having higher ratio of inventories to total assets and higher regression book of value. Revised regression model including only these four independent variables explains about 11.9% of balance-sheet variance (adjusted R square).

Among independent variables that are having significant contribution explaining balance-sheet leverage significant correlations are between profitability indicators (the ratio of net income to the total assets) and regression of book value, and between the ratio of tangible fixed assets to the total assets and the ratio of inventories to the total assets. While there is positive correlation between profitability indicator and growth indicators there is negative correlation between assets indicators.

Table 9. Pearson Correlation between Independent Variables with Significant Predictive Validity of Balance-sheet Leverage

	PP2	PA1	PA3	PG3	MHC2	MHC3
PP2	1	-.111	-.039	.349**	.012	.091
PA1	-.111	1	-.162*	-.100	.014	.015
PA3	-.039	-.162*	1	-.109	-.040	.046
PG3	.349**	-.100	-.109	1	-.056	-.039
MHC2	.012	.014	-.040	-.056	1	.056
MHC3	.091	.015	.046	-.039	.056	1

The results in FBiH show a positive relationship between the firm's capital structure choice and the firm's growth opportunities. That is contrary to the findings of Titman and Wessels (1988), who concluded that growth has significant negative relationship with the capital structure. Myers and Majluf (1984) argue that the assets owned do affect capital structure and the results in FBiH indicate that the ratio of tangible assets to total assets has a negative relationship with the balance-sheet leverage. Some studies suggest that earnings volatility affects the capital structure; however, their results are inconsistent (Bradley, Jarrell, and Kim, 1984). The results on the sample of FBiH companies show that the earnings volatility within the capital structure model defined in this paper does not significantly contribute to the overall prediction.

Newman (2010) investigated the determinants of the capital structure of companies in China. He confirmed that the firm size and age are positively related to leverage (short term, long term and total) and that there is no relationship between the asset structure and leverage. He also found that profitability is negatively related to capital structure choice. The results for FBiH show that balance-sheet leverage is negatively related to the firm's assets and profitability but positively related to the firm's growth. The firm size in FBiH companies was not related to leverage as in China's companies, while assets show negative relationship with leverage, which was not proven in the China's case. Harris and Raviv (1991) summarized the results of several studies on capital structure. They found that leverage in general increases with fixed assets, non-debt tax shields, growth opportunities and firm size and decreases with the volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness. Some of their determinants are part of the capital structure model in this paper. We find that only higher growth opportunities relates to increased leverage, while the remaining relationships are not proved.

Several authors tested the capital structure structural equation model with contradicting results (Titman and Wessels, 1988). Their structural models in entirety prove to be weak, but the results on the relationships between growth and assets with leverage are

in line with our findings. The results further indicated that only one factor related to managerial-level variables influenced the capital structure of sampled firms. The human capital of owners/managers measured by their experience was found to be negatively related to the leverage of sampled firms. In particular, the data analysis revealed that firms run by a manager with a longer experience tended to have a lower financial leverage than those with less experienced owners/managers. This is in line with previous studies that found a negative influence of managerial experience on the leverage of SMEs (Scherr et al., 1993; Coleman and Cohn, 2000; Cassar, 2004). Furthermore, these findings suggest that financiers place greater emphasis on the experience of owners/managers when making lending decisions than on their educational background. They might also be partly explained by the fact that more experienced owners/managers tend to be more control averse than those with less experience.

## Conclusions

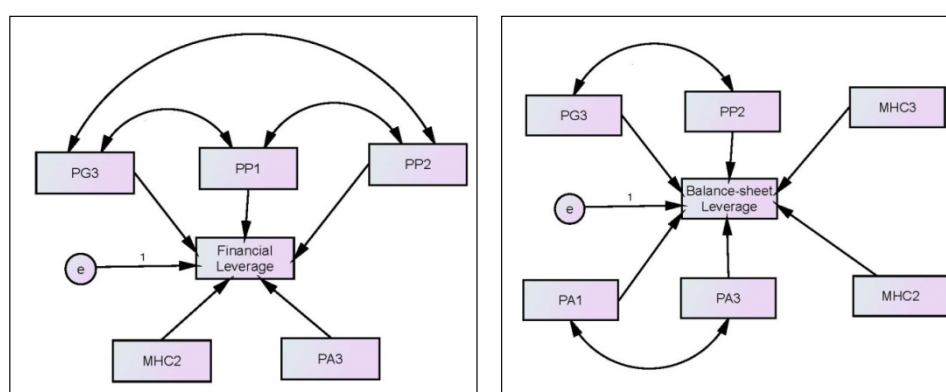
This study is an attempt to identify determinants of capital structure, and develop a plausible model that efficiently discriminates companies with a high and low leverage. The intention was to integrate classical financial theories of the capital structure and personal proxies' theories in order to create a model that combines the companies' characteristics with those of decision makers. Both firm and managerial level determinants can be divided into three groups: those which influence *the willingness* of decision makers to take on debt (risk propensity, control aversion, length of experience), those which influence *the firm's need* for debt (profitability, manager's growth/profit maximization intentions) and those which influence *the ability* of the firm to take on external debt (length of manager's experience, managerial network ties, firm-level variables) (Newman, 2010). The study is based on two alternative leverage ratios, the financial leverage ratio and balance-sheet leverage ratio.

The findings show that the financial leverage is significantly explained by two independent variables. One of them comes from the traditional financial proxies of capital structure and the other from new theories of personal traits. Companies with a less experienced manager and higher firm growth have a higher financial leverage ratio. Therefore, the level of financial leverage depends on the factors influencing the ability of the firm to access external debt, but also on the factors that influence the firm's willingness to take on external debt. The collateral value of the assets, return-on-assets (ROA) as a profitability indicator, and firm growth opportunities are statistically significant predictors of the balance sheet leverage. The financial proxies of capital structure seem to be significant in explaining the capital structure variance in analyzing the balance sheet leverage. Its level depends on the factors influencing the demand for external debt as well as the factors influencing the firm's ability to access external debt. Therefore, companies with lower profitability, lower level of fixed assets and higher growth opportunities have higher balance sheet leverage ratios. The results prove that both financial proxies and personal traits are statistically significant predictors of the capital structure.



In other words, this suggests that certain commonly observed micro-level determinants that are relevant for explaining capital structure in the developed economies are also relevant in the FBiH. This means that some of the insights from the modern finance theory are applicable to our country despite profound institutional differences that exist between the FBiH and those developed countries. Furthermore, based on the findings we could develop path models for prediction of financial and balance sheet leverage that will probably yield covariance matrices in line with the observed covariance matrices. Such proposed models are presented below.

Figure 2. Path Model for Financial and Balance-sheet Leverage



In order to verify the model they should be tested in a follow up study. However, explanatory power of the proposed model is expected to be low. We have found a difference between the results achieved when the leverage is defined by total liabilities instead of only financial debt. The determinants within the model related to the balance-sheet leverage can explain a higher percentage of capital structure variance (13.5%) than the determinants explaining the financial leverage (6%). Second, the achieved low explanatory power of leverage determinants is in line with previous studies in transition economies (Joeveer, 2006; Delcours, 2007). They identified that a number of core determinants are able to explain only about 8% of the variation in leverage if the majority of firms in the sample are unlisted. For the listed firms, about 22% of the variation in leverage is explained by traditional determinants. Of course, the variation explained by traditional determinants in transition economies is lower than in developed economies. This is not surprising because the information asymmetry is higher and observable firm-specific characteristics are not fully reliable from a financial institution' point of view.

Due to the complex number of forces that influence firm relations and managerial activity, capital structure decision is not simply a matter of deterministic, prescriptive principles, but it is, rather, an art, despite all the innovations in financial engineering and changes in the competitive context. It cannot be separated from the intellectual skill of "good" financial managers. Managerial behavioral factors therefore also provide ample opportunities for future research.

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<sup>i</sup> Bosnia and Herzegovina (BiH) consists of the two entities and one district: the Federation of BiH (FBiH) and the Republika Srpska (RS), as well as of the Brčko District.

<sup>ii</sup>  $\ln(\text{Firm size by total revenues})$  and  $\ln(\text{Firm size by average number of employees})$